

SOLAR OBSERVATIONS

SOLAR AND SKY RADIATION MEASUREMENTS DURING NOVEMBER, 1926

By HERBERT H. KIMBALL, Solar Radiation Investigations.

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to the REVIEW for January, 1924, 52:42, January, 1925, 53:29, and July, 1925, 53:318.

From Table 1 it is seen that solar radiation intensities averaged close to the November normals at all three stations.

Shortly after 9 a. m. on the 12th a dense smoke cloud passed over the American University, D. C. Although of but brief duration considerable absorption of solar radiation occurred as is shown by the values of 1.08, 0.56, and 1.08 gram calories obtained at air masses 3.0, 2.5, and 2.0, respectively. Atmospheric dust and sulphur content measurements made during the passage of the cloud show a three-fold increase in the number of dust particles and about double the sulphur content that was found at 8 a. m. Therefore most of the smoke cloud passed over the University instead of enveloping it, as was the case with the cloud of April 7, 1925, and which was described in the REVIEW for April, 1925, p. 147-148.

Table 2 shows a deficiency in the amount of radiation received on a horizontal surface from the sun and sky at all three stations for which normals have been determined.

TABLE 1.—Solar radiation intensities during November, 1926

[Gram-calories per minute per square centimeter of normal surface]
Washington, D. C.

		Sun's zenith distance											
		8a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon	
Date	75th mer. time	Air mass										Local mean solar time	
		A. M.					P. M.						
		e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0		e.
Nov. 1	mm.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.	mm.	
2	4.57	0.90	1.02	1.16	1.32	1.46	0.92	1.00	0.93	0.83	3.45		
3	3.81	0.88	1.02								3.63		
4	3.09				1.04						2.87		
5	4.75			0.92	1.12		1.14	0.93	0.80	0.68	3.99		
6	4.57	0.72	0.80	0.93	1.22		1.21	0.97	0.85	0.75	5.56		
10	4.17	0.75	0.85	1.05	1.35						3.00		
11	2.26	0.64	0.76	0.90							2.36		
12	2.87	0.89	1.01	1.08	1.08			1.06	0.94		2.62		
17	4.37	0.92	0.95	1.12	1.30			0.94	0.86		5.16		
19	3.30		0.85	0.97							3.15		
22	3.15	0.66	0.79	1.18				1.04	0.88	0.76	3.30		
Means		0.80	0.89	1.03	1.20	(1.46)	1.09	0.99	0.88	0.76			
Departures		+0.05	+0.04	+0.03	+0.02		-0.07	+0.01	+0.05	+0.03			

TABLE 1.—Solar radiation intensities during November, 1926—Con.

[Gram-calories per minute per square centimeter of normal surface]—Contd.

Madison, Wis.

Date	Sun's zenith distance										Local mean solar time	
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°		
	75th mer. time	Air mass										
		A. M.					P. M.					
		e.	5.0	4.0	3.0	2.0	1.0	2.0	3.0	4.0		5.0
Nov. 5	<i>mm.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>cal.</i>	<i>mm.</i>	
10	3.45		1.16	1.29	1.43	1.59					4.75	
11	1.88		1.03	1.15	1.29	1.45					2.06	
24	1.68			1.19					1.02		2.87	
Means	2.74		(1.10)	1.14	(1.36)	(1.52)			(1.02)			
Departures			+0.08	-0.01	+0.06				-0.14			

Lincoln, Nebr.

Nov. 1	2.16		1.14	1.25	1.38	1.52			1.09	0.95	2.87
4	3.15	0.89	1.06	1.16	1.38			1.11	0.99	0.87	3.30
9	1.78	1.10	1.19	1.30	1.45	1.63					2.74
11	2.62	0.81	0.95	1.11	1.31		1.33				3.00
26	2.06	0.99	1.11	1.24	1.38	1.54					2.96
29	3.54		1.06	1.18					1.00	0.92	4.67
Means		0.95	1.08	1.21	1.38	1.56	(1.33)	(1.11)	1.03	0.91	
Departures		+0.02	+0.04	+0.02	+0.03	-0.01	-0.03	-0.08	-0.02	-0.03	

* Extrapolated.

At Washington skylight polarization measurements made on seven days give a mean of 62 per cent, with a maximum of 67 per cent on the 1st. At Madison, no measurements were obtained, as the ground was generally covered with snow on the days when the sky was clear.

TABLE 2.—Solar and sky radiation received on a horizontal surface

[Gram-calories per square centimeter of horizontal surface]

Week beginning	Average daily radiation					Average daily departure from normal		
	Wash- ington	Madison	Lincoln	Chi- cago	New York	Wash- ington	Madison	Lincoln
	cal.	cal.	cal.	cal.	cal.	cal.	cal.	cal.
Oct. 29	202	153	243	94	154	-43	-34	-5
Nov. 5	210	194	205	149	136	-13	+25	-27
12	169	61	129	50	122	-30	-87	-86
19	175	126	184	66	110	-1	-8	-18
26	145	127	201	42	103	-13	+2	+13
Deficiency since first of year on Dec. 2						-1,188	-2,016	-3,353

551.506 (261.1) WEATHER OF NORTH AMERICA AND ADJACENT OCEANS

NORTH ATLANTIC OCEAN

By F. A. YOUNG

The North Atlantic HIGH and Icelandic Low were both unusually well developed during the greater part of the month, and, in consequence, the number of days with winds of gale force was considerably above the normal over the eastern section of the steamer lanes. Gales were also reported on from two to three days along the American coast between Nova Scotia and Florida, and on two days in the Gulf of Mexico.

The number of days with fog was apparently less than usual; judging from reports, it occurred on from five to six days over the Grand Banks, and on from three to five days along the American coast, north of Nantucket, while the middle and eastern sections of the steamer lanes were comparatively clear.

On the 1st an area of low pressure was central about 10° west of Malin Head, Ireland, accompanied by moderate to strong gales over the eastern section of the steamer lanes. This Low moved northeastward, decreasing in intensity, and on the 2d and 3d moderate weather prevailed generally, except that on the 2d Julianehaab, Greenland, reported wind southeast, force 9, barometer 28.91 inches.

On the 4th an exceptionally severe disturbance was central near 50° N., 30° W., with winds of from force 10 to 12 in the southerly and westerly quadrants. The storm area was of limited extent however, covering only the region between the forty-fifth and fifty-first parallels and the fifteenth and thirty-fifth meridians. This low pursued the usual northeasterly course, and on the 5th was central off the north coast of Scotland; it had apparently